UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,959	06/14/2001	Stephen K. Barton	206094US2PCT	6671

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ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

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	Application No.	Applicant(s)
Office Action Summary	09/807,959	BARTON ET AL.
	Examiner	Art Unit	
	John L. Shew	2664	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>8/5/2005</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is

closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-14, 16, 20 and 21* is/are allowed.

6)☒ Claim(s) *1-6, 8, 9, 11, 17 and 23* is/are rejected.

7)☐ Claim(s) *7, 10, 18 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 August 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

    1.☒ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, 5, 6, 8, 9, 11, 15, 17, 22, 23 are rejected under 35 U.S.C. 102(b) as

being anticipated by Nakamura (European Patent Application EP0854620A2).

Claim 1, Nakamura teaches a method of generating a synchronization pulse (Abstract

lines1-20) referenced by a synchronization signal generating means, representing a

symbol boundary in an OFDM signal (Title, Abstract lines 1-25) referenced by the

OFDM demodulation apparatus correlation between the data period and guard period at

a position away from the modulated signal by one modulation time representing the

symbol boundary, comprising useful symbol periods separated by guard spaces (FIG.

1) referenced by the Effective Symbol Interval and Guard Interval, with data in each

guard space corresponding to part of the data in a respective useful period (FIG. 1,

column 2 lines 13-23) referenced by the symbol end side including a period having

correlation to the guard interval head side i.e. a period having the same signal portion

and the same interval on the end side, the method comprising providing a signal

representing the degree of correlation between samples of a received signal which are

separated by a period corresponding to the useful part of the symbol (FIG. 2A, FIG. 2B,

FIG. 2C, column 2 lines 24-42) referenced by the Correlation Signal generated by the

Original Signal to the Delayed Signal wherein the Guard Interval is correlated to the end

of the Effective Symbol, the signal thus providing an output representing for each

symbol an interval during which significant correlation is found (FIG. 2D, column 2 lines

43-51) referenced by the integration of the correlation signal to find significant

correlation during the interval, the method comprising the further step of determining the

varying degrees of correlation within said interval and thereby detecting a sub-interval

within which a maximum degree of correlation occurs (FIG. 6F, column 5 lines 49-52,

FIG. 6C, column 9 lines 15-23) referenced by interval signal integration which reflects

varying degrees of correlation and the subinterval Tc/2 or defined by half of the Guard

Interval Tc wherein the peak correlation occurs, and arranging for the synchronization

pulse to be provided within this sub-interval (FIG. 6E, FIG. 6F, column 9 lines 15-39)

referenced by the output Correlation Signal and Signal of Integration during the

subinterval.

Claim 2, Nakamura teaches the sub-interval is determined by applying a threshold to

the signal representing the degree of correlation (FIG. 6F, column 9 lines 40-56)

referenced by the TH threshold of the interval integration slightly lower than the

amplitude of the triangular integrated signal.

Claim 3, Nakamura teaches the threshold is varied (column 9 lines 40-58, column 10

lines 1-5) referenced by the determination of the threshold for removing noise with noise

being variable thereby the determination of the threshold is variable.

Claim 4, Nakamura teaches the threshold represents a value which is dependent upon

the maximum value of the signal representing the degree of correlation (FIG. 6E, FIG.

6F, column 9 line 40-56) referenced by the threshold TH being slightly lower than the

amplitude of the triangular wave signal which represents the maximum degree of

correlation.

Claim 5, Nakamura teaches the signal representing the degree of correlation is subject

to filtering prior to using the signal to determine said sub-interval (FIG. 5) referenced by

the filtering action of Correlators 47 46 prior to the Integration by Parts unit 48 which

outputs a signal representing the degree of correlation, the filtering being such that each

filtered output sample represents substantially an average of a predetermined number

of successive samples (FIG. 5, column 10 lines 15-26) referenced by Averaging Circuit

49 of the time synchronization signals wherein the number used for averaging is

predetermined to be 76, said predetermined number being substantially less than the

number of samples within a guard space (column 10 lines 15-26) referenced by the

reduced number of samples at 15.

Claim 6, Nakamura teaches the filtered output represents values averaged over a

plurality of symbols (column 10 lines 15-26) referenced by the averaging circuit output

averages the time synchronization signals of the respective predetermined number of

symbols.

Claim 8, Nakamura teaches the filtered output is subjected to further filtering before

being processed to provide a signal representing a fine frequency offset (FIG. 5, column

10 lines 27-43) referenced by the further filtering action of the Phase

Discriminating/Frequency Sinc unit 51 to provide an AFC frequency signal adjustment to

the RF Amplifier/Frequency Converter unit 32.

Claim 9, Nakamura teaches the step of adjusting the timing of the synchronization pulse

only if a calculated error in the current timing exceeds a predetermined threshold (FIG.

5, FIG. 6F, column 9 lines 52-58, column 10 lines 1-5) referenced by the use of

threshold TH to determine the output of Integration by Parts/Peak Discriminator Circuit

48 wherein if the TH is not reached to correct for noise error then no Time Sync Signal

is generated.

Claim 11, Nakamura teaches wherein the timing of the synchronisation pulse is

adjusted in predetermined quantities corresponding to a plurality of sample periods

(column 10 lines 6-26) referenced by the averaging circuit to average the timing

synchronization signals based on a predetermined number of symbols wherein the

number of symbols can be 76, 55, 35, 15 each being a different sample period.

Claim 15, Nakamura teaches a method of generating a synchronization pulse (Abstract

lines1-20) referenced by a synchronization signal generating means, representing a

symbol boundary in an OFDM signal (Title, Abstract lines 1-25) referenced by the

OFDM demodulation apparatus correlation between the data period and guard period at

a position away from the modulated signal by one modulation time representing the

symbol boundary, comprising useful symbol periods separated by guard spaces (FIG.

1) referenced by the Effective Symbol Interval and Guard Interval, with data in each

guard space corresponding to part of the data in a respective useful period (FIG. 1,

column 2 lines 13-23) referenced by the symbol end side including a period having

correlation to the guard interval head side i.e. a period having the same signal portion

and the same interval on the end side, the method including the step of adjusting the

timing of the synchronization pulse in predetermined quantities corresponding to a

plurality of sample periods (column 10 lines 6-26) referenced by the averaging circuit to

average the timing synchronization signals based on a predetermined number of

symbols wherein the number of symbols can be 76, 55, 35, 15 each being a different

sample period.

Claim 17, Nakamura teaches a method of receiving an OFDM signal (Title, Abstract

lines 1-20, FIG. 5) referenced by the OFDM demodulating receiver apparatus, the

method including the step of generating a synchronization pulse (Abstract lines1-20)

referenced by a synchronization signal generating means, and using the

synchronization pulse in order to apply a Fast Fourier Transform to complex samples

derived from the OFDM signal (FIG. 5, column 10 lines 15-26) referenced by the

synchronization pulse from the Averaging Circuit 49 to the FFT Circuit 35 to adjust the

timing of the OFDM signal at Antenna 31.

Claim 22, Nakamura teaches an apparatus for generating a synchronizing pulse (FIG.

5) referenced by the reception (demodulating) apparatus with the Time Sync Signal

Generating Circuit 48.

Claim 23, Nakamura teaches an OFDM apparatus for receiving an OFDM signal (Title,

Abstract lines 1-20, FIG. 5) referenced by the OFDM demodulating receiver apparatus.

Allowable Subject Matter

2.   Claims 12, 13, 14, 16, 20, 21 are allowed.

Claims 7, 10, 18, 19 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Response to Arguments

Claim 1 amended to recite a step of determining varying degrees of correlation within an

interval does not overcome the prior art of Nakamura. The integration of the correlation

signal (FIG. 6F) reflects a varying degree of correlation through summation of the signal

over time interval $T_c/2$. The discussion pertaining to Nakamura wherein the threshold

has no relationship with timing errors is not applicable to Claim 1, since there is no

limitation covering this aspect.

Claim 15 was not amended. The arguments presented traversing the rejection of Claim

15 are not considered since there is no amendment to claim 15.

1.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to John L. Shew whose telephone number is 571-272-

3137. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

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:RVISORY PATENT EXAMINE.